ACC NR: AM7000694

SUB CODE: 20/ SUBM DATE: 14Jul66/ ORIG REF: 158/ OTH REF: 28/

Card 2/2

GEL'PERIN, N.I.; MUSTAFAYEV, S.A.; Prinimal uchastiye KRASIL'NIKOV, V.A.

Longitudinal mixing in a column extractor with vibrating plates.
Khim. prom. no.5:360-364 My '64. (MIRA 17:9)

VDOVENKO, V.M.; SUGLOBOV, D.N.; KRASIL'NIKOV, V.A.

Infrared absorption spectra of uranyl nitrate and complexes with neutral addends. Radiokhimiia 5 no.3:311-319 '63.
(MIRA 16:10)

(Uranyl nitrate--Absorption spectra)
(Complex compounds--Absorption spectra)

BELYAYEV, L.M.; KRASIL'NIKOV, V.A.; LYAMOV, V.Ye.; PANOVA, V.P.; SIL'VESTEROVA, I.M.; SMIRNOV, S.P.; GIL'VARG, A.B.

Interaction of ultrasonic waves with conduction electrons in cadmium sulfide. Kristallografiia 10 no.2:252-255 Mr-Ap '65. (MIRA 18:7)

1. Institut kristallografii AN SSSR.

KRASIL'NIKOV, V. A.

"Preliminary Experiments on the Acoustical Probing of the Atmosphere by Means of a Monochromatic Ray," Dok. AN 32, No. 1, 1941.

Inst. Theoretical Geophysics; Acad. Sci., Moscow.

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611O(

KRASIL'NIKOV, V. A.,

4B-133 551.551:551.596.1

Krasil'nikov, V. A., O rasprostranenii zvuka v turbulentnoi atmosfere. /On the propagation of sound in a turbulent atmosphere./ Akademiia Nauk, SSSR, Doklady, 47 (7):486-489, 1945. 5 refs., 4 eqs. DLC--An attempt to explain on the basis of statistical theory of turbulence, experimental results on fluctuations of the phase of sound waves in a turbulent atmosphere. Formulas based on KRASIL'NIKOV (1945), KOLMOGOROV (1941), OBUKHOV (1941) and empirical data of GODECKE (1935) and FINDEISEN (1936), show dependence on speed of wind and on the 2/3 law of KOLMOGOROV. Subject Headings: 1. Atmospheric turbulence 2. Acoustical propagation.--M.R.

Meteorological Abstract
Vol. 4 No. 2
February 1953
Bibliography on Turbulent Exchange

Also: Dok. AN 46, No. 3, 1945.
Theoretical Geophysics Inst., Acad. Sci.

KRASIL'NIKOV, V. A.

Dec 1947

USSR/Physics
Atmosphere - Disturbances
Sound

"The Fluctuation in the Amplitudes of Sound During Diffusion in a Turbulent Atmosphere," V. A. Krasil nikov, Inst Theoretical Geophysics, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVIII, No 7

Study of mentioned phenomenon from standpoint of static theory of turbulence. Studies conducted on basis of following assumptions: 1) nonhomogeneous field of speed of basic current is much larger than

60T106

[redacted]

Dec 1947

USSR/Physics (Contd)

the length of a sound wave, in other words they studied geometry of acoustics; 2) field of speed of basic current is noncompressible; and 3) effect of temperature variation on change of sonic speed is disregarded. Submitted by Academician A. N. Kolmogorov, 26 Jun 1947.

60T106

[redacted]

Krasil'nikov, V. A. On the influence of the fluctuations of [illegible] on the propagation [illegible] Izvestiya Akad. Nauk SSSR [illegible] (1949). (Russian)

[illegible] in the atmosphere are [illegible] the index of refraction, and [illegible] their influence on the propagation of [illegible]. The fluctuations of temperature [illegible] A. M. Obukhov [same vol. [illegible]] [illegible] being the distance [illegible] a constant depending [illegible] fluctuations are considered [illegible] than the wave length and [illegible] than a [illegible] between the [illegible] the temperature, and [illegible] the obtained [illegible] for [illegible] of the amplitude the [illegible] where L is the distance apart [illegible] and λ a length depending [illegible] between the second derivatives [illegible] at two different points of the [illegible] for the relative fluctuations [illegible] the same distance L from [illegible] of the phases are, however, [illegible] *G. Toraldo di Francia* (Florence).

Source: Mathematical Reviews, Vol. 10, No. 9

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611(

KRASIL'NIKOV, V. A.

"Fluctuations in the Angle of Incidence of Light from Twinkling Stars," Dok. AN 65, No. 3, 1949.

KRASIL'NIK V, V. A.

PA 3/50T91

USSR/Physics - Sound, Propagation 1 Aug 49
Atmosphere

"New Experiments in the Propagation of Sound in the Atmosphere," V. A. Krasil'nikov, K. M. Ivanov-Shits, Sci Res Inst of Phys, Moscow State U imeni M. V. Lomonosov, 4 pp

"Dok Ak Nauk SSSR" Vol LXVII, No 4

Conducted measurements in Jul and Aug 1948 near Moscow. Transmitted voltage from sound g[illegible]rator to a 50-watt amplifier which swung the loud-speaker. Placed crystal microphones at distances of 22, 45, and 67 meters. Hung speaker and microphone on

3/50T91

USSR/Physics - Sound, Propagation Aug 49
(Contd)

masts 8 meters high. Used frequencies of 3 and 5 kc. Results show fluctuations of ph[illegible] [illegible]d amplitude. Submitted by Acad B. A. Vveden[illegible]kiy 4 Jun 49.

3/50T91

KRASIL'NIKOV, V. A.

PA 175T94

USSR/Physics - Ultrasonics
Interferometers 21 Jun 50

"Traveling-Wave Ultrasonic Interferometer," N. L. Telesnin, V. A. Krasil'nikov, Sci Res Inst Phys, Moscow State U imeni Lomonosov

"Dok Ak Nauk SSSR" Vol LXXII, No 6, pp 1037-1039

Usual method of measuring velocity of ultrasounds in liquids and gases is by Pierce's interferometer with standing waves. Describes here another method, which uses traveling ultrasonic waves instead and cathode-ray tube (Lissajous figures) and involves displacing receiver and varying frequency. Submitted 25 Apr 50 by Acad B. A. Vvedenskiy.

[redacted]

175T94

KRASIL'NIKOV, V. A.

PHASE I

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 26 - I

BOOK

Author: KRASIL'NIKOV, V. A.

Call No.: QC243.K7

Full Title: SOUND WAVES IN AIR, WATER, AND SOLIDS

Transliterated Title: Zvukovyye volny v vozdukhe, vode, i tverdykh telakh

Publishing Data

Originating Agency: None

Publishing House: State Publishing House For Theoretical Engineering Literature

Date: 1951 No. of pp.: 372 No. of copies: 10,000

Editorial Staff

Editor: None

Editor-in-Chief: None Tech. Ed.: None

Others: Most of the diagrams contained in this book were drawn by S. N. Rubin Appraiser: None

Text Data

Coverage: This book treats the sound propagation theory, including descriptions of sound generating and receiving apparatus; in addition, sonar, ultrasonic microscope, ultrasonic detection of metal flaws, and seismography are discussed.

This work gives a popular presentation of the above aspects. The exposition is based on the latest advances

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110(

Zvukovyye volny v vozdukhe, vode i tverdykh telakh AID 26 - I

in the field of modern acoustics. Fairly good photos and diagrams of the following equipment is to be found: oscillographs, resonators, ultrasonic interferometer, ultrasonic microscope (S. Ya. Sokolov), piezoquartz emitter (P. Lanzheven), seismographs (B. B. Golitzyn and D. P. Kirnos).

Table of Contents:

Purpose: Intended for persons with secondary education, secondary school teachers, students of academic institutions, engineers, and seamen specializing in hydroacoustics.

Facilities: Acoustics and Physics Laboratories of The Moskva State University.

No. of Russian and Slavic References: 18 (of these 10 are Soviet)

Available: Library of Congress. 2/2

KRASILNIKOV, V. A.

"Measurements of Young's Modulus of Rochelle Salt Blocks in the Dynamic State," a report read at the conference of the Acoustics Commission AS USSR held in Leningrad 1-3 Feb 51.

W-21610, 25 Feb 52

KRASIL'NIKOV, V. A.

KRASIL'NIKOV, V. A. - "Effect of Pulsations of the Refractive Index in the Atmosphere on the Propagation of Sound and Electromagnetic Waves." Sub 23 Apr 52, Moscow Order of Lenin State U imeni M. V. Lomonosov. (Dissertation for the Degree of Doctor in Physicomathematical Sciences).

SO: Vechernaya Moskva January-December 1952

KRASIL'NIKOV, V.A.

USSR.

551.508.12:551.524

Krasil'nikov, V. A. and Tatarskii, V. I., O zavisimosti srednego kvadratichnogo fluktuatsii faz [redacted] [illegible] [Dependence of the [illegible] deviation of phase and amplitude fluctuations on the dimensions of objective observing [illegible]] Akademiia Nauk SSSR, Doklady [illegible] Jun. 21, 1953.

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611O(

[illegible] theoretical study on the decrease of scintillations of stars with increasing diameter of the objective, taking into account the temperature fluctuations in the turbulent atmosphere, and assuming that [illegible] correlation function [illegible] absolute temperature. Subject Headings: 1. Scintillation 2. Temperature fluctuations—[illegible]

KRASILNIKOV, V.E. [illegible]

USSR.

Krasil'nikov, V. A. [illegible] ultrasonic waves by dissipation in the air layer near the ground. Doklady Akad. Nauk SSSR 88(4) [illegible], Feb. 1, [illegible] Experimental investigations were carried out during summer and autumn of 1951 [illegible]

...Akademiia Nauk SSSR, Doklady, 41(7), 1945 (...
(B-135, Feb. 1951, 1(A)B) ... 1. Ultrasonic waves 2. Turbulence effects
—NTL

KRASILNIKOV, V. A.

U.S.S.R.

3264. Dispersion of sound in turbulent flow. V. A. Krasil'nikov and V. I. Tatarskii. Dokl. Akad. Nauk SSSR, 90, No. 2, 159-62 (1953) In Russian. English translation, U.S. National Sci. Found. NSF-tr-121.

On the assumptions (1) that a turbulent flow can be described by the equations of motion of an incompressible viscous fluid, (2) that in an incompressible fluid, the dispersions by temperature irregularities and velocity fluctuations respectively, are independent, and (3) that the fluctuations of the velocity of flow, v', are considerably smaller than the speed of sound, c, in the medium, it is shown that the wave equation of sound in the moving medium, neglecting acceleration, can be reduced to $\Delta\phi - \partial^2\phi/c^2\partial t^2 = 2v_i\partial^2\phi/c^2\partial x_i\partial t$, where ϕ is the potential function of the sound field. This equation is solved by the method of successive approximations. Expressions are derived for the effective range of sound dispersion in the solid angle $d\sigma$ per unit of distance travelled by the incident sound wave, and for the dispersion coefficient. The coefficient of "backward dispersion" is constant at high frequencies. It is possible that the dispersion of sound by the acceleration field may afford a better explanation of the damping of infra-sonic sound waves in the atmosphere than that afforded by the present theory of dispersion due to viscosity and thermal conductivity.

J. S. G. THOMAS

KRASIL'NIKOV, V.A.; LESHKOVTSEV, V.A., redaktor; GAVRILOV, S.S., tekhnicheskiy redaktor

[Sound waves in the air, water and solid bodies] Zvukovye volny v vozdukhe, vode i tverdykh telakh. Izd. 2-e, perer. Moskva, Gos. izd-vo tekhn.-teoret. lit-ry, 1954. 439 p. [Microfilm] (MLRA 7:10) (Sound waves)

A comprehensive and popular test on the propagation of sound and ultra sonic waves in the air (atmospheric acoustics), in water (hydro acoustics) and in the earth (seismology) and their utilization. All questions are treated on the basis of the most recent advances in modern acoustics. Ch. 1 deals with vibrations and waves; Ch. 2, Sound waves in the air; Ch. 3, Receivers and emitters, Oscillographs; Ch. 4, Experiments with sound, sound analysis (speed, temperature effect, propagation, interference, dispersion); Ch. 5, Ultra sonic air waves (shock and explosion waves); Ch. 6, Propagation of sound in enclosed spaces and in the free atmosphere; Ch. 7, Sound and ultra-sonic waves in water (sound of the sea); Ch. 8, Sound and ultra-sonic waves in solid bodies; and Ch. 9, Propagation of elastic waves in the earth's crust. The manual is intended for high school teachers, college and technical school students, engineers and hydro-acousticians. Subject Headings: 1. Acoustical propagation 2. Textbooks.

KRASILNIKOV, V. A. and OBUKHOV, A. M.

Physics Research Institute, Lomonosov State University, Moscow.

"On Wave Propagation in Media with Irregular Fluctuations of the Refractive Index" paper presented at 2nd International Congress on Acoustics, CAmbridge, Mass., 17-23 June 1956.

So: B-100200

KRASILNIKOV, V.A.

Krasil'nikov, V. A., and Obukhov, A. M. On propagation [illegible] in a medium with random inhomogeneities in the [illegible]. Akust. Ž. 2 (1956), 104–112. (Russian)

This paper is a very limited survey of methods of approximate solution of the wave equation $u_{tt}=c^2\nabla^2 u$ when the velocity c is written in the form $c=c_0(1+\mu)$, μ being a small parameter depending upon position but not upon time. Such a condition is often encountered when turbulence is present in atmospheric acoustics and optics, underwater acoustics and radio wave propagation [illegible] under [illegible] and radio wave propagation in the [illegible] methods of perturbation, ray theory, in both [illegible] correlation functions, structure functions, and combinations of these are touched upon with an indication of the domain of applicability of each. Nearly all the references are to works of the authors. [illegible] (San Diego, Calif.)

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611(

KRASIL'NIKOV, V. A.

USSR / Electricity G

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9661

Author : Goncharov, K.V., Krasil'nikov, V.A.
Inst : Not given
Title : Thermal Mechanical Oscillations (Fluctuations) of Piezo-electric Crystals.

Orig Pub : Izv. AN SSR, Ser. fiz., 1956, 20, No 2, 231-236.

Abstract : Investigations of thermal noises in piezoelectric resonators made of Rochelle salt, ammonium phosphate, and barium-titanate ceramics have shown that the noise spectra have peaks at the natural frequencies of the resonators. A setup for the study of this effect does not differ in principle from setups used to investigate thermal noise of conductors and is capable of measurement accuracy of 15 -- 20%. Comparison of the experimentally-determined frequency dependences of the active component of the electric

Card : 1/2

USSR / Electricity G

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9661

Abstract : impedance of the resonators with the characteristics of the thermal noises has shown that within the measurement accuracy one can employ the Nyquist formulas for piezoelectrics without error. The procedure employed can be used for the study ofthe internal friction in piezoelectrics, and also for the determination of the sensitivity limits of piezo receivers and their frequency characteristics of sensitivity.

Card : 2/2

KRASIL'NIKOV, V.A.

J-4

USSR / Acoustics. Ultrasonics.

Abs Jour : Ref Zhur - Fizika No 3, 1957, No 7467

Author : Zarembo, L.K., Krasil'nikov, V.A., Shklovskaya-Kordi, V.V.
Inst : Laboratory of Anisotropic Structures, Academy of Sciences USSR, Moscow
Title : Distortion of Ultrasonic Waves of Finite Amplitude in Liquids.

Orig Pub : Dokl. AN SSSR, 1956, 109, No 3, 485-488

Abstract : An investigation was made of the bahavior of harmonics in a wave of finite amplitude, propagating in a liquid. The quartz radiator operated at a frequency of 1.5 Mc. The receivers were quartz plateswith resonant frequencies 1.5, 3, 4.5 Mc. The dependence of the amplitude of the acoustic pressure of the second and third harmonic on the distance to the radiator was obtained graphically for various voltages on the quartz in the following liquid media: tap water, transformer oil, and glycerin. The distortion in the shape of the sound wave and the associated appearance of harmonics in the liquid is made possible by the non-

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USSR / Acoustics, Ultrasonics,

J-4

Abs Jour : Ref Zhur - Fizika No 3, 1957, No 7467

Abstracts : linearity of the equation of motion and of the ratio between the pressure p and the density ρ in the adiabatic process.

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KRASIL NIKOV, V.A.

B-6

USSR/Liquids and Amorphous Bodies. Gases

KRASILNIKOV, V. A.

AUTHOR: Zarembo, L.K., Krasilnikov, V.A. and Shklovskaya-Kordi, V.V.

TITLE: Propagation of ultra-sonic waves of finite amplitude in liquids. (O rasprostranenii ultrazvukovykh voln konechnoy amplitudy v zhidkostyakh.)

46-1-4/20

PERIODICAL: "Akusticheskiy Zhurnal" (Journal of Acoustics), 1957, Vol. III, No. 1, pp. 29 - 36 (U.S.S.R.)

ABSTRACT: Non-linear properties of liquids have been directly proved by Mikhaylov 1) from the "mixing" effect of two ultra-sonic waves, by Gorelik, A.G. and Zverev, 2), who achieved amplitude and phase modulation of ultra-sonics by sound, by Loeber and Hidemann, 3), who observed by optical method the distortion of standing waves in liquids and by the authors of the present article in one of their earlier works, 4), in which they observed harmonics of a wave with finite amplitude propagated in a liquid. These non-linear properties of liquids govern the wave propagation in liquids. It can be said that the greater the amplitude the greater would be the coefficient of absorption; the fact observed by Eykhenvald, A.A. 5), during experiments to confirm the investigations by Neklepayev, N. of ultra-sound absorption in air. In the present article, results of experimental determination of the absorption coefficient of a wave with finite amplitude in various liquids, as a function of the sound intensity (with a fundamental of 1.5 Mc/s)

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Propagation of ultra-sonic waves of finite amplitude in liquids. (Cont.)

46-1-4/20

are given. It was established that: in liquids with small absorption coefficient at small intensities (methyl and ethyl alcohol, toluol), this coefficient is larger by two orders of magnitude at the intensity of $4 W/cm^2$, as compared with its value at small intensities; increase of the absorption coefficient is linearly dependent on acoustical pressure. This confirms the approximate theory of Fox and Wallace, 8). Measurement of absorption at an increased static pressure in the medium shows that it is not due to cavitation. A method of measurement of harmonics has been developed and experimentally tested for certain liquids. The measuring installation was composed of an acoustical filter-resonant receiver-resonant amplifier, all forming a spectrum analyser at a fixed line of an "acoustical spectrum". Growth, stabilisation and eventual decay of harmonics were also investigated. All these measurements have definitely confirmed the theory of mechanism of absorption proposed by Fox and Wallace.

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There are 6 graphs and one numerical table with relevant parameters and data of the experiment. There are 12 references, of which 6 are Russian.

Lab. of Anisotropic Structures, AS USSR

Krasilnikov, V.A

AUTHOR: Bergmann, L. 46-1-15/20

TITLE: Book review: Krasilnikov, V.A.

PERIODICAL: "Akusticheskiy Zhurnal" (Journal of Acoustics), 1957, Vol. III, No. 1, pp. 87 - 88 (U.S.S.R.)

ABSTRACT: "Ultra-sound and its application in science and technology". Translated from 6th, 1954 German edition. Edited by V.S. Grigorev and L.D. Rozenberg. Moscow 1956. ("Ultrazvuk i Ego Primenenie v Nauke i Tekhnike". Perevod c 6-Go Nemetskogo Izdaniya (1954G.) Pod Redaktsiey V.S. Grigoreva i L.D. Rozenberga, M.IL, 1956G) Favourably reviewed by V.A. Krasilnikov.

AVAILABLE:

Card 1/1

KRASIL'NIKOV, V.A., prof.

Conference on accoustics. Vest. Mosk. un. Ser. mat., mekh., astron., fiz., khim., 12 no.5:237-241 '57. (MIRA 11:9)
(Sound--Congresses)

KRASIL'NIKOV, V.A.

24(1) PHASE I BOOK EXPLOITATION SOV/1627

Vsesoyuznaya akusticheskaya konferentsiya. 4th, Moscow, 1958

Referaty dokladov (Abstracts of Reports at the Fourth All-Union Acoustical Conference) Pt. 2. Moscow, Akad. nauk SSSR, 1958. 44 p. Number of copies printed not given.

Sponsoring Agency: Akademiya nauk SSSR.

Resp. Ed.: L.M. Brekhovskikh, Corresponding Member, USSR Academy of Sciences.

PURPOSE: These abstracts are intended for scientists and engineers interested in acoustics.

COVERAGE: This is a mimeographed collection of brief abstracts of papers presented at the Fourth All-Union Acoustical Conference. The subjects covered are propagation of sound in nonhomogeneous media, nonlinear acoustics, ultrasonics, acoustic measurements, electroacoustics and architectural and structural acoustics.

TABLE OF CONTENTS:

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The book has no Table of Contents, but contains the following sections:

PLENARY SESSIONS

KRASILNIKOV, V. A.

BUROV, V. A., ZAREMBO, L. K., KRASILNIKOV, V. A. and SHKLOVSKAYA-KORDY, V. V.

"Some Problems on the Propagation of Waves of Finite Amplitude in Liquids."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 4 Jun 58.

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110

AUTHOR: Krasil'nikov, V. A. 46-4-1-18/23

TITLE: All-Union Conference on Acoustics (Vsesoyuznaya akusticheskaya konferentsiya.)

PERIODICAL: Akusticheskiy Zhurnal, 1958, Vol.IV, Nr.1, pp.105-106. (USSR)

ABSTRACT: The All-Union Acoustical Conference, organized by the Commission on Acoustics of the Academy of Sciences of the USSR, by the Accoustics Institute of the Academy of Sciences of the USSR and by Moscow University, was held in Moscow on 24-29 June, 1957. This Conference was divided into the following sections: Propagation of sound in non-homogeneous media, Emission and diffraction of sound, Waves of finite amplitude, Physics of ultrasound, Musical acoustics, Physiological acoustics, Study of speech. Over 400 scientists took part in the conference, and eight representatives of foreign countries were present. About 150 papers were read at the conference. At three Plenary Sessions of the Conference review papers were presented. L.M. Brekhovskikh and L.D. Rozenberg (Acoustics Institute of the Academy of Sciences of the USSR) reviewed the physical basis of the industrial

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applications of ultrasound. I.I. Malecki (Poland) reported on ultrasonic engineering in Poland. Ye.D. Bedereu (Rumania) reported on development of acoustics in Rumania. V.A. Krasil'nikov (Moscow University) described the work carried out in the Laboratory of Anisotropic Structures of the Academy of Sciences of the USSR and in the Chair of Acoustics, Physics Department of Moscow University, on propagation of high-intensity ultrasonica in liquids. I.L. Fabelinskiy (Physical Institute imeni P.N. Lebedev of the Academy of Sciences of USSR) reported on his work on propagation of hyper-sound in liquids. V. Reichardt (East Germany) described a new method of measurement of loudness in a diffuse acoustic field. P. Bryuel' (Denmark) dealt with certain acoustical measurements and apparatus for them. Ma Da-Yu (China) read a theoretical paper on acoustical properties of rooms of a wrong shape. I.G. Mikhaylov, V.A. Solov'yev and V.P. Syrnikov (Leningrad University) reviewed the problems of molecular acoustics. During one of the plenary sessions Ye.S. Sokolova (Leningrad Electrotechnical Institute)

All-Union Conference on Acoustics . 46- 4 -1-18/23

talked on the life and scientific work of the late S.Ya. Sokolov, corresponding member of the Academy of Sciences of the USSR. In the section "Propagation of Sound in Non-Homogeneous Media" Yu. M. Sukharevskiy spoke on propagation of sound in seas. G.I. Priymak and V.V. Ol'shevskiy dealt with the same subject of sound-propagation in seas. Scattering of sound-waves on small non-uniformities in a wave guide was dealt with by M.A. Isakovich. Guided propagation of sound in a liquid layer with a diven distribution of sound velocity was described by Yu.L. Gazaryan. Fluctuations of acoustic field in turbulent medium was dealt with theoretically by V.I. Tatarskiy, and experimentally by B.A. Suchkov. L.A. Chernov's paper described the effect of fluctuations on the diffractional image of focusing systems. Propagation of sound in non-homogeneous media was dealt with also by A.N. Tikhonov and V.N. Shakhsuvarov, A.N. Barkhatov, V.V. Tyutekin and I.D. Ivanov. In the section "Emission and Diffraction of Sound", G.D. Malyuzhents read a paper on "Sommerfeld's Integral and Diffraction in a Wedge-shaped Region", L.A. Vaynshteyn read a paper on

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All-Union Conference on Acoustics

an approximate method of separation of variables in the boundary problems of electrodynamics and acoustics. M.D. Khaskind, in his paper "Diffraction and Emission of Acoustic Waves", showed that if an acoustic field is produced by a torsional or rotational motion of a body of arbitrary shape, it is possible to find the accelerations acting on the same body when placed in an acoustic field. S.N. Rzhevkin read a paper on "Theory of an Ultrasonic Interferometer". Diffraction and scattering of acoustic waves were dealt with in papers by P.G. Ufimtsev, A.F. Filippov, Yu.P. Lysanov, L.N. Sretenskiy, M.P. Sakharova, and L.M. Lyamshev. Emission by a cylinder was discussed in a paper by I.D. Urusovskiy. Emission by cylindrical concentrator was dealt with in a paper by I.N. Kanevskiy and L.D. Rozenberg. In the section "Waves of Finite Amplitude", L.K. Zarembo, V.A. Krasil'nikov and V.V. Shklovskaya-Kordi read a paper on deformation of acoustic waveform in liquids and the effects of these deformations on absorption of waves of finite amplitude. Saw-toothed waves in liquids were discussed by V.A. Burov

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46- 4-1-18/23

All-Union Conference on Acoustics

and V.A. Krasil'nikov, as well as by K.A. Naugol'nykh, N.A. Roy and E.V. Romanenko. Absorption of finite-amplitude waves in liquids was dealt with in papers by V.A. Krasil'nikov and D.V. Khaminov, L.K. Zarembo and V.A. Burov. A non-linear effect of fountain formation of drops was reported by V.I. Sorokin. I.G. Mikhaylov and V.A. Shutilov discussed the asymmetry of diffraction of light on acoustic waves of high intensity. A.L. Polyakova, N.A. Roy and D.Sh. Frolov described an acoustic pulsation produced by an electric discharge in water. A.S. Ryzhov and S.A. Khristianovich dealt with decay of acoustic waves at large distances from an explosion, and non-linear reflection of a weak shock wave from a solid wall. Non-linear reflection of a weak shock wave from a free surface was described by A.N. Grib, A.G. Ryabinin and S.A. Khristianovich. In the section "Physics of Ultrasound" I.I. Moiseyev-Ol'khovskiy described a theory of translational disperson of ultrasound. Propagation of ultrasound in solid bodies was dealt with by K.I. Baranskiy (excitation of quartz at up to 2×10^9 c/s), K.S.
Card 5/6 Aleksandrov (elastic waves in crystals), V.P. Sizov

All-Union Conference on Acoustics 46-4-1-18/23

and L.G. Merkulov (propagation of ultrasound in metals). Propagation of ultrasonics in liquids and gases was dealt with by B.B. Kudryavtsev, V.F. Nozdrev, I.G. Mikhaylov and others. Physicochemical action of ultrasound was reported on by I.G. Polotskiy, A.P. Kapustin, V.M. Fridman and others. Visualization of ultrasonic fields was described by V.I. Makarov and Yu.E. Semennikov. Ultrasonic measurements were dealt with by V.L. Vlasov and A.Ye. Reznikov. K.V. Goncharov showed that it is possible to calibrate piezoelectric transducer sensitivity by thermal noise. The use of ferrites in acoustic transducers was described by I.P. Golyamina. In the section "Musical Acoustics" L.B. Dmitriyev described X-ray photographs of vocal organs of high quality singers. Ye.A. Rudakov and D.D. Yurchenko showed that the spectral composition of vowels of singers differs but little from one person to another. Maynel (East Germany) described acoustic spectra of violins. About 30 papers were read in the "Physiological Acoustics" and "Investigation of Speech" sections.

Card 6/6

1. Acoustics--Conference 2. Sound--Diffraction 3. Sound--Scattering 4. Sound--Reflection 5. Liquids--Applications 6. Sound--Test methods 7. Sound--Test results

AUTHORS: Burov, V. A., Krasil'nikov, V. A. 20-118-5-20/59

TITLE: On the Immediate Observation of the Distortion of the Form of Intensive Supersonic Waves in a Liquid (Neposredstvennoye nablyudeniye iskazheniya formy intensivnykh ul'trazvukovykh voln v zhidkosti)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp. 920-923 (USSR)

ABSTRACT: The immediate observation mentioned in the title is possible at intensities of a few watt per cm^2 at the frequencies of the range of megacycles. The device for such observations consists of an ultrasonic generator, which is supplied by an intensive radiogenerator. The intensity of ultrasonics of the frequency of 1 megacycle in a distance of 1 cm from the plate was determined calorimetrically, it amounted to 40 watt/cm^2. This intensity corresponds to an acoustic excess pressure of $\sim$10 atmospheres. The performance and the process of the measurings are briefly discussed. A diagram shows a series of oscillograms of the form of the supersonic wave in different distances from the generator. The almost sine-shaped wave in a distance of 2 cm

Card 1/3

On the Immediate Observation of the Distortion of the Form of Intensive Supersonic Waves in a Liquid 20-118-5-20/59

from the generator begins to distort in larger distance. A steep front is developping and the wave more and more adopts a serrated form. The amplitude of the main wave decreases, slowly at first and then faster, with increasing distance. At the same time the amplitudes of the second, third and higher harmonics increase, reach a peak and then begin to decrease again. The second harmonic reaches its peak in a distance of 10 cm. The stabilization distance depends on the intensity, under the same conditions apart from this. A further diagram shows the curves of the percentage share of the harmonics of different high order with regard to the amplitude of the main wave. The range of more or less stable values of these harmonics is about 16 cm. In this range the wave has a relatively stable form. The form of the wave modifies with proceeding time. The experiments carried out provide the following result: There are at least 2 different distortions during the propagation of supersonic waves with finite amplitude in a liquid: a) distortions as a consequence of the nonlinearity of the equation of state and the equation of motion; b) distortions as a consequence of the cavity. There are 4 figures and 4 references, 3 of which are Soviet.

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APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110(

On the Immediate Observation of the Distortion of the Form of Intensive Supersonic Waves in a Liquid 2' -118-5-20/59

ASSOCIATION: Laboratoriya anizotropnykh struktur Akademii nauk SSSR (Laboratory for Anisotropic Structure of the AS USSR) Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow National University imeni M. V. Lomonosov)

PRESENTED: August 31, 1957, by L. I. Sedov, Member, Academy of Sciences, USSR

SUBMITTED: August 25, 1957

Card 3/3

KRASIL'NIKOV, V.A.
P2

PHASE I BOOK EXPLOITATION SOV/3528

Moscow. Dom nauchno-tekhnicheskoy propagandy

Primeneniye ul'trazvuka v promyshlennosti; sbornik statey (Industrial Use of Ultrasound; Collection of Articles) Moscow, Mashgiz, 1959. 301 p. 8,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politisheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): V.F. Nozdrev, Doctor of Physical and Mathematical Sciences, Professor; Ed. (Inside book): G.F. Kochetova, Engineer; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on Machinery and Instrument Manufacturing (Mashgiz): N.V. Pokrovskiy, Engineer.

PURPOSE: This book is intended for engineers and technicians engaged in the application of ultrasonics in machinery manufacture and in other branches of industry.

COVERAGE: This is a collection of papers read at the first all-Union conference on the use of ultrasonics in industry. Attention

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is focused mainly on the description of ultrasonic equipment and on the use of ultrasound for the machining of hard materials and for flaw detection. The effect of ultrasound on metal-crystallation processes is also discussed. No personalities are mentioned. References accompany many of the papers.

TABLE OF CONTENTS:

KRASILNIKOV, V. A., and ZAREMBO, L. K.

"Some questions of non-linear acoustics in liquids."

paper to be presented at the Third Intl. Congress on Acoustics, IUPAP, Stuttgart, GFR, 1-8 Sep 1959.

Acoustics Inst, Acad. Sci. USSR.

SOV/46-5-2-6/34

AUTHORS: Krasil'nikov, V.A. and Khaminov, D.V.

TITLE: Propagation of Ultrasonic Waves of Finite-Amplitude in a Relaxing Liquid (Rasprostraneniye ul'trazvukovykh voln konechnoy amplitudy v relaksiruyushchey zhidkosti)

PERIODICAL: Akusticheskiy zhurnal, 1959, Vol 5, Nr 2, pp 166-169 (USSR)

ABSTRACT: The authors studied propagation of finite-amplitude ($p = 0.1 - 3$ atm) ultrasonic waves of 0.5, 1 and 2 Mc/s frequency in acetic acid solutions of 25, 50, 80 and 98% concentrations at 22 $\pm 2^\circ$C. Acetic acid is a typical relaxing liquid (relaxation frequency of 0.5 Mc/s at 20°C). For the sake of comparison, ultrasonic propagation was also studied in pure glycerine, which is a non-relaxing, strongly absorbing liquid. For each liquid the fundamental (first) and second-harmonic amplitudes were measured as functions from the distance of the source. From these amplitudes the following were calculated quantities at each frequency: the absorption coefficient α for the fundamental frequency; the initial pressure at the radiator at the source p_{10}; the ratio of the peak amplitude of pressure of the second

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APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611O(

harmonic to the initial pressure p_2/p_{10}; distance from the source at which the second harmonic became stable x_m. The absorption coefficient α was determined from the graph of log p(x) using the formula

$$\alpha(x) = \Delta \ln p(x)/\Delta x.$$

Extrapolation of this graph to low values of x gave the value of sound pressure p_{10} at the source. Results of these measurements are listed in Tables 1 and 2 (col.2 of Table 1 gives sound velocities taken from I.G. Mikhaylov's paper in Doklady AN SSSR, Vol.31, Nr.4, 324-336, 1941). The authors measured also the phase difference between the fundamental and the second harmonic, and deduced dispersion in acetic acid at 0.5 - 4 Mc/s: $\Delta c/c$ = 1.2, 0.3 and 0.25% for acetic acid solutions of 98, 80 and 50% concentrations respectively. From the results obtained the authors draw the following conclusions: (1) The total absorption coefficient of 0.1 - 3 atm waves in acetic acid does not depend on the distance from the source and the value of the initial pressure, and, within the limits of

SOV/46-5-2-6/34

Propagation of Ultrasonic Waves of Finite-Amplitude in a Relaxing Liquid

experimental error, the coefficient is the same as that found on propagation of waves of very small amplitude;
(2) the relative magnitude of the second harmonic is very small (it is of the order of 1% in 98% acetic acid at pressure p_{10} exceeding 1 atm);
(3) the relative contribution of the third harmonic is at least one order smaller than that of the second harmonic;
(4) propagation of waves of finite amplitude in glycerine is qualitatively of the same nature as propagation of such waves in acetic acid near its relaxation frequency;
(5) on propagation of waves of finite amplitude in a relaxing liquid the nature of the relaxation process is not affected, but this conclusion does not necessarily apply to relaxing liquids with low attenuation;
(6) the results obtained for acetic acid agree satisfactorily with the theory of propagation of finite-amplitude waves in gases proposed by Thuras, Jenkins and O'Neil (Ref.4).

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SOV/46-5-2-6/34

Propagation of Ultrasonic Waves of Finite-Amplitude in a Relaxing Liquid

There are 1 figure, 2 tables and 5 references, of which 2 are Soviet and 3 English.

ASSOCIATION: Kafedra akustiki Moskovskogo gosudarstvennogo universiteta (Chair of Acoustics, Moscow State University)

SUBMITTED: November 12, 1957

Card 4/4

24(1)

AUTHORS: Zarembo, L. K., Krasil'nikov, V. A. SOV/53-68-4-5/12

TITLE: Some Problems of the Propagation of Ultrasonic Waves of Finite Amplitudes in Liquids (Nekotoryye voprosy rasprostraneniya ul'trazvukovykh voln konechnoy amplitudy v zhidkostyakh)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 4, pp 687-715 (USSR)

ABSTRACT: The authors give a survey of the distortion- and absorption effects of ultrasonic waves of finite amplitude in liquids, special weight being laid upon the distortion in dissipative media and the hereby caused increase in absorption. In the introduction several general problems, especially the nonlinear processes, are discussed. In the following chapter the theory of the distortion and absorption of waves of finite amplitudes is explained, first of all for non-dissipative, and later for dissipative media. In a table data are given for a number of liquids, which were calculated by different methods. The following chapter 3 deals with experimental methods of determining nonlinear dissipation as well as with qualitative comparisons between experimental and theoretical results. First, the method and some experiments carried out for the purpose of investigating the influence of nonlinearity upon the

Card 1/3

Some Problems of the Propagation of Ultrasonic Waves of Finite Amplitudes in Liquids SOV/53-68-4-5/12

propagation of ultrasonic waves in liquids are discussed (Fig 2), and later the propagation of the harmonics is dealt with. Figure 3a in a diagram shows the variation of the second harmonic depending upon the distance from the sound source in water as well as in transformer oil; figure 3b shows the course of these curves for the third harmonic in water. Further investigations of the wave shape (Burov et al., Naugol'nykh et al.)(Fig 4) are discussed. Figure 5 shows the spectrum of the blue Hg-line (4358 Å), diffracted on a sound wave (583 kilocycles) in distilled water, 5 cm distant from the sound source. Figure 6 shows the scheme of an optical device for the observation of the distorted form of the wave, figure 7 shows the propagation of light intensity (diagram) under certain conditions. Figure 8 finally shows recordings of a diffraction of light on a distorted wave and on the harmonics. The single experiments and their results are discussed. This chapter ends with a discussion of the analysis of the harmonics (Fig 9). The next chapter deals with the absorption of waves of finite amplitudes in liquids. Again methods, experiments, and their results are described, and several characteristic curves are

Card 2/3

Some Problems of the Propagation of Ultrasonic Waves of Finite Amplitudes in Liquids SOV/53-68-4-5/12

shown in form of diagrams (temperature dependence of α/ν, dependence of the relative absorption coefficient in water on the acoustic Reynolds number, the same for methyl alcohol; table 2 gives data concerning absorption in transformer oil). The paper ends with a short discussion. There are 13 figures, 2 tables, and 46 references, 30 of which are Soviet.

Card 3/3

24(1)

AUTHORS: Burov, V. A., Krasil'nikov, ~~V. A.~~ SOV/20-124-3-21/67

TITLE: On the Absorption of Ultrasonic Waves of High Intensity in Water (O pogloshchenii ul'trazvukovykh voln bol'shoy intensivnosti v vode)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 571-574 (USSR)

ABSTRACT: The authors investigate the behavior of ultrasonic saw-tooth waves of high intensity as a function of frequency, intensity, and the distance from the radiating body. For this purpose the absorption of ultrasonic waves was measured in distilled water at room temperature at the frequencies of 1; 1.5 and 2 megacycles at intensities of from 50 to 100 + 250 w/cm^2. Measurements were carried out according to the calorimetric method by using a Dewar vessel. Intensity measurements were accurate up to 10-15%. A diagram shows the dependence of the intensity W of ultrasonics on the distance to the emission opening of the radiating body at various intensities and frequencies. The second diagram shows several curves for the dependence of the absorption coefficient (with respect to the energy

Card 1/3

On the Absorption of Ultrasonic Waves of High Intensity in Water SOV/20-124-3-21/67

$\alpha = -(\partial W/\partial x)/W)$ on the distance from the quartz plate o- the measuring device. The shape of these curves indicates the non-exponential character of absorption and a complicated dependence of α on the distance to the radiating body, on ultrasonic frequency, and on the initial intensity W_0.

α attains a maximum at a certain distance x. The behavior of α found may be explained satisfactorily by the connection between ultrasonic absorption and the distortion of the shape of the ultrasonic wave. Within the first centimeters from the radiating body, the wave continuously accumulates the distortion and is transformed from a sinusoidal into a saw-tooth wave. In the case of great W_0 this maximum distortion occurs at the smallest distances, and on this occasion α attains a maximum. The maximum of α is attained at such values of x as agree with the maximum of the distortion of the shape of the wave. The existence of a region in which the shape is relatively stable and nearly saw-tooth-shaped, permits an interesting comparison between experimental data and the approximation

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On the Absorption of Ultrasonic Waves of High Intensity in Water

SOV/20-124-3-21/67

theory for the propagation of the saw-tooth-like shape of the wave. Also a law for the decrease of intensity with increasing distance is given. Agreement between theoretical and experimental data is good. The absorption coefficient of a saw-tooth wave is proportional to the frequency and amplitude of pressure. There are 4 figures and 8 references, 6 of which are Soviet.

ASSOCIATION: Laboratoriya anizotropnykh struktur Akademii nauk SSSR (Laboratory for Anisotropic Structures of the Academy of Sciences, USSR) Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: September 29, 1958, by M. A. Leontovich, Academician

SUBMITTED: September 27, 1958

Card 3/3

KRASIL'NIKOV, V.A.

45

PHASE I BOOK EXPLOITATION SOV/5644

Vserossiyskaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov

Primeneniye ul'traakustiki k issledovaniyu veshchestva. vyp. 10. (Utilization of Ultrasonics for the Investigation of Materials. no. 10) Moscow, Izd-vo MOPI, 1960. 321 p. 1000 copies printed.

Eds.: V. F. Nozdrev, Professor, and B. B. Kudryavtsev, Professor.

PURPOSE: This book is intended for physicists and engineers interested in ultrasonic engineering.

COVERAGE: The collection of articles [illegible] on the application of ultrasound in medicine, chemistry, physics, [illegible], ceramics, petroleum and mining engineering, defectoscopy, and other fields. No personalities are mentioned. References accompany individual articles.

Zarembo, L. K., and V. A. Krasil' nikov [Mosk. tekhnol. in-t legk. pr-sti, MGU - Moscow Technological Institute of Light Industry, Moscow State University]. Problem of the Effect of Non-Linear Distortions of Wave Form on the Accuracy of Measuring Low-Amplitude Ultrasonic-Wave Absorption p. 317

PHASE I BOOK EXPLOITATION SOV/4049

Krasil'nikov, Vladimir Aleksandrovich

Zvukovyye i ul'trazvukovyye volny v vozdukhe, vode i tverdykh telakh (Sound and Ultrasonic Waves in Air, Water, and Solids). 3rd ed., rev. and enl. Moscow, Fizmatgiz, 1960. 560 p. 10,000 copies printed.

Ed.: L. K. Zarembo; Tech. Ed.: Ye. A. Yermakova.

PURPOSE: This book is intended for high school teachers, students, technicians, engineers, marine acoustic-sounding specialists, and for those working with acoustics in related fields.

COVERAGE: The book explains the basic physical problems related to the propagation of sonic and supersonic waves in air, water and solids and describes the various applications of these waves. Considerable attention is given to supersonic waves and their applications, and to the propagation of sound in the atmosphere (atmospheric acoustics), in the sea (hydroacoustics) and in the earth (seismology). Problems in the propagation of high-intensity sonic and supersonic waves in gases and especially in liquids are discussed along with the most important problems of aerothermoacoustics (noise and the generation of sound by turbulence) in the propagation of elastic waves in solids (es-

Card ~~1/11~~ 1/12

37428

S/188/62/000/002/013/013
B163/B102

AUTHORS: Krasil'nikov, V. A., Gedroyts, A. A.

TITLE: Distortion of the shape of an ultrasonic wave of finite amplitude in solids

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 2, 1962, 92-93

TEXT: Experimental investigation of non-linear effects in the propagation of intense ultrasonic waves in solids. A sinusoidal wave with a frequency of 5 Mc/sec is emitted from a piezoelectric quartz resonator plate (X cut, 16 mm diameter). Acoustic contact with the polished end face of a cylindrical rod 16 mm, in diameter, is made through a thin layer of transformer oil. At the other end of the rod is a quartz plate with a natural frequency of twice the emitter frequency, i. e. 10 Mc/sec. The output is filtered and amplified by a resonance amplifier and recorded by a ЭО-58 (EO-58) cathode-ray-oscillograph. In order to exclude, standing waves, the emitter is pulsed with rectangular pulses of 30-40 μsec duration

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Distortion of the shape ... S/188/62/000/002/013/013
B163/B102

and a repetition frequency of 200 cps. Measurements in duralumin and MA - 8 (MA - 8) alloy proved the existence of non-linear effects. The amplitude of the second harmonic is a function of the rod length. With increasing rod length, the amplitude first rises and later decreases. On application of 1000 v at the omitter quartz the rod length corresponding to the maximum amplitude is 20 - 30 cm. In this case the pressure amplitude ratio $\alpha = p_2/p_1$ of the second harmonic and the fundamental wave which is a characteristic measure for non-linear effects is of the order of 2 - 3 %. In an aluminum single crystal, the α value found is 6 times higher than predicted by Riemann's theory if only the non-linearity of the equation of motion is taken into account. This result indicates that the non-linearity of the equation of state plays an important role, too. In some other solids, such as plexiglass and some other glasses, α was found to be smaller than the theoretical value. Non-linear effects could be observed in longitudinal waves only, and not in transversel waves.

ASSOCIATION: Moskovskiy universitet, Kafedra akustiki (Moscow University, Department of Acoustics) [Abstracter's note: Name of

Card 2/3

Distortion of the shape ... S/188/62/000/002/013/013
B163/B102

association was taken from first page of journal.]

SUBMITTED: January 9, 1962

J

Card 3/3

S/188/62/000/003/012/012
B104/B112

AUTHORS: Gedroyts, A. A., Zarembo, L. K., Krasil'nikov, V. A.

TITLE: Elastic waves with finite amplitudes in solids and lattice unharmonicity

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 3, 1962, 92-93

TEXT: The calculation of γ/β by reference to the Born model of a solid is discussed. γ is the "mean" nonlinear coefficient, represented as a linear combination of all nonlinear coefficients in Hooke's law; β is the linear coefficient in Hooke's law. Deviations from this law are due to the nonlinearity of forces exerted by the ions within an ion crystal upon one definite ion. The larger the coefficient of thermal expansion the greater is the nonlinearity of Hooke's law. The deviation from nonlinearity is chiefly due to intercrystalline interaction. The effects of polycrystallicity, crystal defects, etc on Hooke's law are still unexplained.

ASSOCIATION: Kafedra akustiki (Department of Acoustics)
SUBMITTED: March 19, 1962
Card 1/1

41127
S/056/62/043/004/010/061
B102/B180

AUTHORS: Burov, V. A., Krasil'nikov, V. A., Sukharevskaya, O. Yu.

TITLE: Ultrasonic splitting of a Mössbauer absorption line in tin oxide $Sn^{119}O_2$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 4(10), 1962, 1184 - 1185 .

TEXT: Experiments, similar to those of Ruby and Bolef (Phys. Rev. Lett., 5, 5, 1960) with Fe^{57}, were carried out with the 23.8-kev gamma radiation of the Sn^{119} atoms in SnO_2. The Sn^{119m} source was deposited on aluminum foil. 25 and 35 mg/cm^2 thick layers of natural SnO_2 deposited on quartz X-cuts (16×18 mm^2, natural frequency 20 Mc were absorbers with a distance of 7 cm between source and absorber was a palladium filter to attenuate parasitic 26-kev X rays. The gamma radiation was recorded by a photomultiplier with NaI(Tl)crystal the pulses of which passed via a pulse-height analyzer to a ПС-10000(PS-10000) scaling circuit. The quartz plate with the absorber was electrically excited with 18.5 Mc/sec. This non-resonance

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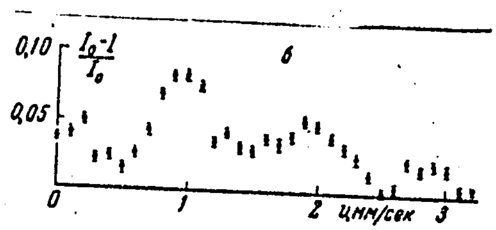
Ultrasonic splitting ... S/056/62/043/004/010/061
B102/B180

frequency was used to reduce possible frequency drifts. The maximum voltage applied to the plate was 95v. The line splitting at 95 v is shown in the figure. There is 1 figure.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: May 9, 1962

Fig.



Card 2/2

S/056/62/043/005/005/058
B163/B186

AUTHORS: Gedroyts, A. A., Krasil'nikov, V. A.

TITLE: Elastic waves of finite amplitude in solids and deviations from Hooke's law

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 5(11), 1962, 1592-1599

TEXT: Originally sinusoidal longitudinal ultrasonic waves of sufficient intensity (alternating pressures of the order of 1 atmosphere) are distorted during propagation through a solid. The experimental procedure is the same as in the earlier paper (V. A. Krasil'nikov, A. A. Gedroyts, Vestnik MGU, seriya III, 2, 92, 1962) wherein some of the results of the present paper were prepublished in less detail. The pressure amplitude of the second harmonic increases with the distance from the emitter, attains a maximum, and then decreases due to dissipative losses. This result is similar to what occurs in liquids. The distortion can be explained by assuming deviations from harmonic bonding of the atoms in the lattice. It is shown that the ratio of the
Card 1/2

Elastic waves of finite amplitude ... S/056/62/043/005/005/058
B163/B186

coefficients in the quadratic and the linear term in the equation of state for the solid body can be determined from the measured relative pressure amplitude of the second harmonic with respect to the pressure amplitude of the fundamental frequency. This ratio is measured for Al single crystals, NaCl, KCl, LiF, and the Mg-Al alloy МА-8 (MA-8). The given values are in good agreement with the experimental results which Bridgman et al. obtained from static measurements under pressure from all sides. There are 3 figures and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: May 23, 1962

Card 2/2

GUN SYU-FEN' [Kung Hsiu-fen]; ZAREMBO, L.K.; KRASIL'NIKOV, V.A.

Measurement of the acoustic nonlinear parameter of liquid nitrogen. Akust. zhur. 9 no.3:382-383 '63. (MIRA 16:8)

1. Kafedra akustiki Moskovskogo gosudarstvennogo universiteta.
(Liquid nitrogen--Acoustic properties)

L 10837-63
ACCESSION NR: AP3000742 S/0020/63/150/003/0515/0518

AUTHOR: Gedroyts, A. A.; Zarembo, L. K.; Krasil'nikov, V. A. 44

TITLE: Shear waves of finite amplitude in poly- and single metallic crystals

SOURCE: AN SSSR. Doklady, v. 150, no. 3, 1963, 515-518

TOPIC TAGS: transversal waves, ultrasonics, Hooke's law, longitudinal ultrasonic waves, magnesium-aluminum alloy MA-8, aluminum, duraluminum, zinc, cadmium, shear nonlinearity

ABSTRACT: In several previous papers the authors have investigated the nonlinear distortion of longitudinal ultrasonic waves (deviation from Hooke's law). The present paper deals with the nonlinear distortions in the shear wave which are much smaller. The experimental work was done on polycrystalline metals (magnesium-aluminum alloy MA-8, aluminum, and duraluminum) and on single crystals of aluminum, zinc, and cadmium. The distortion was observed by the appearance of a second harmonic. For detection, the usual ultrasonic equipment was used. Effects of small load and short heating are described. It was found that the shear nonlinearity in single crystals is very sensitive to small loads and to heating. It is believed that this sensitivity is partly due to dislocations. Orig. art. has: 2 figures.

Card 1/2

Moscow St. U.

ACCESSION NR: AP4041440 S/0188/64/000/003/0072/0081

AUTHOR: Krasil'nikov, V. A., Shikhlinskaya, R. E.

TITLE: High-frequency region of the noise-formation spectrum of a jet stream

SOURCE: Moscow. Universitet. Vestnik. Seriya 3. Fizika, astronomiya, no. 3, 1964, 72-81

TOPIC TAGS: jet stream, high velocity stream, aerodynamics, jet noise, noise formation spectrum, high frequency jet noise, submerged air stream, Mach eddy wave, barium titanate

ABSTRACT: The article contains a study of the spectrum and directional characteristics of noise emitted by a submerged stream of air escaping from a conical nozzle under excess pressure greater than the critical, that is, greater than 0.9 atmospheres. The results of measurements of the spectral and directional characteristics, compared with photographs of the stream under various conditions, support the belief that the radiation spectrum of the stream includes a discrete radiation, connected with the "cellular" structure of the stream, high-frequency noise, which may be related to "Mach eddy waves",

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ACCESSION NR: AP4041440

and relatively low-frequency noise of turbulent origin. Under the test conditions described in the article, the stream has a periodic "cellular" structure and an axial velocity corresponding to M = 1. The dimensions of the "cells" are shown to decrease as the selected pressure p_{sel} is reduced. A block diagram of the experimental set-up may be seen in Figure 1 of the Enclosure. As an audio oscillation receiver, barium titanate ceramic plates were used, oscillating through their thickness at frequencies below the fundamental eigenfrequency. Most of the measurements were conducted with plates of the following parameters: diameter 2R = 6 mm; thickness d = 2mm (uniform frequency response to about 300 kc) and 2R = 10 mm and d = 4 mm (uniform frequency response to about 180 kc). The sensitivity of the receiving plates was on the order of a few microvolts per bar. Other technical details concerning the test device are given in the article. Graphs are presented which illustrate the directional characteristics of the stream noise at frequencies from 18 to 180 kc and at pressures of 2.1, 3.1 and 4.8 atm. from a nozzle of D = 5 mm. The relative distribution of the sound pressure is plotted for angles of

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ACCESSION NR: AP4041440

azimuth of from $\varphi = 20°$ to $\varphi = 120°$. "The authors thank V. I. Makarov for his valuable advice on the photographic technique." Orig. art. has: 3 formulas and 6 figures.

ASSOCIATION: Kafedro akustiki, Moskovskiy Gos. Universitet (Department of Acoustics, Moscow State University)

SUBMITTED: 25Jul63 ENCL: 01

SUB CODE: PR, ME NO REF SOV: 001 OTHER: 011

Card 3/4

ACCESSION NR: AP4041440

ENCLOSURE: 01

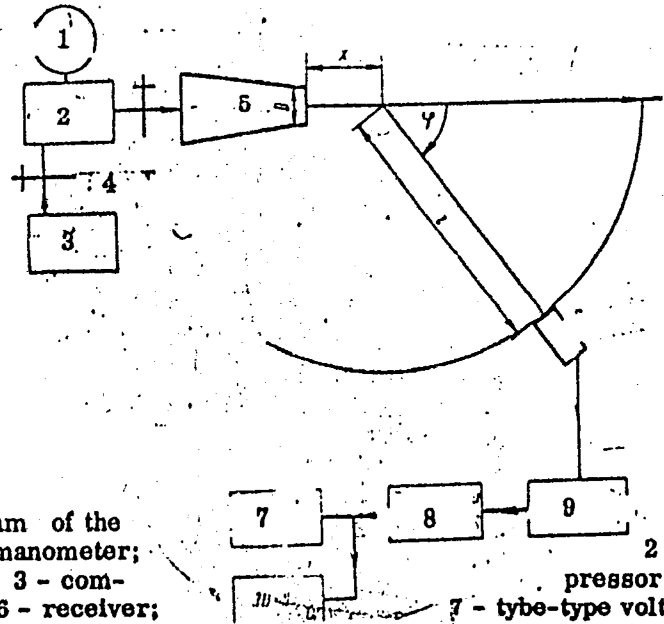

Fig. 1. Block diagram of the experimental set-up; 1 - manometer; 2 - storage area (reservoir); 3 - compressor; 4 - valve; 5 - nozzle, 6 - receiver; 7 - tybe-type voltmeter; 8 - resonance amplifier; 9 - HF filter

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APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R00082611(

[illegible]

ACCESSION NR: AP5016652 UR/0056/65/048/006/1598/1603

AUTHORS: Kun, Hsiu-fen; Zarembo, L.K.; Krasil'nikov, V.A.

TITLE: Experimental investigation of combination scattering of sound by sound in solids

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 6, 1965, 1598-1603

TOPIC TAGS: acoustic scattering, combination scattering, acoustic wave, longitudinal wave, transverse wave

ABSTRACT: This is an elaboration of a short preliminary communication (Akust. zh. v. 11, 112, 1965) reporting an experimental study of the scattering of a transverse wave by a transverse wave of the same frequency, in which case a longitudinal wave of double frequency is obtained. The present article presents more detailed results obtained in polycrystalline aluminum. The interactions studied were

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ACCESSION NR: AP5016552

those in which a longitudinal wave of double frequency is obtained from the interaction of two transverse waves, a longitudinal wave of combined frequency is obtained from interaction between a longitudinal and a transverse wave, and a transverse wave of difference frequency is obtained from an interaction between a longitudinal and a transverse wave. It is shown that under certain (resonant) conditions, nonlinear scattering of sound by sound occurs in solids, in contrast with gases and liquids, thus resulting in a scattered wave with a combination frequency. The various nonlinear parameters are estimated for the different types of interaction, as are the ratios of the incident amplitude to the amplitude of the combination wave. Orig. art. has: 3 figures, 1 formula, and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 23Jan65 ENCL: 00 SUB CODE: GP

NR REF SOV: 005 OTHER: 004

Card 2/2

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110(

ACC NR: AR6035053 SOURCE CODE: UR/0058/66/000/008/E072/E072

AUTHOR: Krasil'nikov, V. A.; Belyayev, L. M.; Lyamov, V. Ye.; Panova, V. P.; Sil'vestrova, I. M.; Uchastkin, V. I.

TITLE: Study of the attenuation and amplification of ultrasound in cadmium sulfide monocrystals

SOURCE: Ref. zh. Fizika, Abs. 8E549

REF SOURCE: Sb. Nekotoryye vopr. vzaimodeystviya ul'trazvyk. voln s elektronami provodim. v kristallakh. M., 1965, 66-76

TOPIC TAGS: cadmium sulfide, ultrasound, semiconductor crystal, dielectric crystal, ultrasound absorption, ultrasound amplification, pulse amplification, pulse absorption, ultrasonic wave

ABSTRACT: A study was made of the absorption and amplification of short pulses of longitudinal and transverse ultrasonic waves with frequencies of 20—25 Mc in cadmium sulfide monocrystals with varying degrees of photosensitivity and dark conductivity. Samples with In-electrodes were cemented with styracryl between

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two fused quartz buffers. The conductivity of the samples was varied by illuminating them with an incandescent lamp through a light filter. Dependence curves of ultrasound absorption as a function of short-term exposures to radiation were found to be in agreement with theoretical curves and with results obtained by other authors. A super-position the drift field with $\sim 10\ \mu$ sec pulses synchronized with ultrasound pulses, showed in some samples an amplification of ultrasound waves, polarized along the optical axis of the crystals. The greatest absolute amplification obtained for 24-Mc transverse waves was ~20 дб/см. At greater driving voltages self-excitation of ultrasound oscillations occurred without benefit of input signals. The point of inflection in the volt-ampere characteristic of illuminated samples corresponds to the excitation of oscillations and the beginning of amplification. The drift mobility of electrons within the 140--180 $cm^2/v \cdot sec$ range is computed from the magnitude of the drift field at the moment of current saturation and of ultrasound intensification. V. Shutilov. [Translation of abstract] [SP]

SUB CODE: 20/

Card 2/2

ACC NR: AP7002019 SOURCE CODE: UR/0142/66/009/005/0616/0621

AUTHOR: Krasil'nikov, V. D.

ORG: none

TITLE: Efficiency of suppressing impulse noise by nonlinear feedback

SOURCE: IVUZ. Radiotekhnika, v. 9, no. 5, 1966, 616-621

TOPIC TAGS: signal noise separation, impulse noise, negative feedback

ABSTRACT: Suggested by A. A. Gorbachev, a method of suppressing impulse noise by a nonlinear negative feedback responsive to instantaneous values of rf oscillations (Radiotekhnika, 1963, v. 18, no. 2) is further examined. It is found that: (1) In the case when only a desirable AM signal and an impulse noise are applied to the receiver input, the nonlinear-negative-feedback suppression system (NFS) is more efficient than the wideband-limiting-narrow-band system (WLN),

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ACC NR: AP7002019

for modulation factors m $\leq$ 30% and $\Omega_{\delta}/\Omega_{n} < 15$; here, Ω_{δ} and Ω_{n} are passbands of the broad- and narrow-band receiver channels; with $\Omega_{\delta}/\Omega_{n} > 15$, the WLN becomes more efficient; (2) If a strong interfering signal is applied to the broadband-channel output, the efficiency of NFS depends on the $\Delta\omega_{m}/\Omega_{s}$ ratio and on the amplitude ratio of desirable-plus-interfering signals and impulse noise; here, $\Delta\omega_{m}$ - frequency shift with respect to the desirable-signal frequency, Ω_{s} - frequency band of the desirable AM signal; starting with certain $\Delta\omega_{m}$, the efficiency of NFS begins exceeding that of WLN; (3) If several interfering signals nearly as strong as the desirable signal and symmetrical with the latter's frequency are applied, both methods become equal; (4) The hardware required for NFS is more complicated than that for WLN. Orig. art. has: 3 figures and 18 formulas.

SUB CODE: 09 / SUBM DATE: 30Oct64 / ORIG REF: 003

Card 2/2

GORBACHEV, A.A.; KRASIL'NIKOV, V.D.

Detection of AM and FM oscillations using the steepness of the high-frequency oscillation. Izv. vys. ucheb. zav.; radiotekh. 4 no. 2:218-220 Mr-Ap '61. (MIRA 14:5)

1. Rekomendovana Nauchno-issledovatel'skim radiofizicheskim institutom pri Gor'kovskom gosudarstvennom universitete imeni N.I. Lobachevskogo.
(Radio detectors)

KRASIL'NIKOV, V.D., gornyy inzh.; SIDORENKO, I.A., gornyy inzh.; TSOY, A.G., gornyy inzh.

Cinephotometric method of studying the productivity of rotary-bucket excavators. Nauch. trudy Mosk. inst. radioelek. i gor. elektromekh. no.46:128-132 '62. (MIRA 17:1)

KRASIL'NIKOV, V. K., Docent and GONCHAROV, K. V.

"Electric Thermal Oscillations (Fluctuations) of Piezoelectric Crystals," a paper delivered at the Section of Radiophysics, Physics Faculty, Conference on Radiophysics, Moscow State U., 10-14 May 55, Vest. Mosk. U., Ser. Fiz-Mat. i Yest. Nauk, No.6, 1955.

Sum 900, 26 Apr 56

AGEYEV, I.K.; KRASIL'NIKOV, V.M.

Improving the design of the "Tampella" cammed debarker. Bum.prom. 31 no.4:18-19 Ap '56. (MLRA 9:7)

1. Vtoroy Kaliningradskiy tsellyulozno-bumazhnyy kombinat.
(Bark peeling)

KACHAN, I.K.; SULTANOVICH, A.I.; KRASIL'NIKOV, V.M.

Prospects for introducing spark proof automatic and remote control equipmsnt into the petroleum and gas industries. Neft. khoz. 40 no.4:41-44 Ap '62. (MIRA 15:5)
(Automatic control) (Remote control)

DUNSKIY, V.F.; YEVDOKIMOV, I.F.; KRASIL'NIKOV, V.M.; MIKULIN, K.P.; YUZHNYY, Z.M.

Settling of a coarsely dispersed aerosol from the surface layer of the atmosphere onto the underlying surface of the earth. Trudy GGO no.172:192-204 '65. (MIRA 18:8)

AUTHORS: Krasil'nikov, V.N., Makarov, G.I. SOV/54-58-3-5 /19

TITLE: Transient Processes in Linear Vibrators (Nestatsionarnyye protsessy v lineynykh vibratorakh)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 3, pp 27 - 50 (USSR)

ABSTRACT: The present paper is a part of the dissertation written by V.N. Krasil'nikov. G.I. Makarov suggested the problem and helped clarify a number of questions. The authors investigated transient processes in thin aerials. Paragraph 1 deals with the problems arising in the theory of thin aerials. Although the basic investigations on the steady theory of thin aerials have been published already some time ago (Refs 1,2) discussions arose in Soviet and American technical publications (Refs 4-8), dealing with the formulation of the integral equation for an aerial with a so-called gap. The transient excitation of a thin cylindric aerial (§ 2) as well as transient current waves in the aerial (§ 3) were investigated. From the practical point of view 2 facts are of particular importance in the investigation of transient processes in various systems: 1) the behaviour of the system during the initial moments, especially the investigation of the first half waves of

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Transient Processes in Linear Vibrators SOV/54-58-3-5/19

the signal, 2) the characteristic of the process as a whole and the determination of the time after the lapse of which the system becomes steady. Paragraph 3 gives the answer to the first question. The current in the direct and in the once reflected wave was found in the first approximation. Transient distortions were found only in a small domain around the front. These transient phenomena which depend on the diameter of the aerial must be considered in the examination of the signal front. As regards the second problem, it appears that from principal considerations repeatedly reflected waves must be investigated and the constantly increasing transient process in the range of the front has to be considered. In the case of thin aerials the real transient process can be assumed asymptotic. In the case of an arbitrarily thin aerial the transient distortions in the range of the travelling wave front are completely absent. As the radius of the aerial is insignificantly small, it can be assumed that the transient characteristic impedances introduced in § 3 adopt their definite values $Z(z)$ from the very beginning. For this reason the coefficient of reflection on steady as well as on transient conditions differs only little from (-1) and can be replaced by the steady

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formula $K_o e^{2i\delta_o}$. The interaction of the reflected waves with the generator must be considered as well. This is possible if the considerations are started from the simplest quasisteady case. The summation of all travelling waves must yield the steady conditions in the vibrator. According to the suggested method transient processes in thin aerials can be thoroughly investigated also on the occasion of more complicated cases. The analysis does not become too voluminous if in the case of a sufficiently low ratio $\frac{a}{l}$ two basic classes of transient processes in aerials which are determined by the longitudinal and transverse dimensions are investigated separately. The transient phenomena in the field of the aerial (above all in the distant zone) can also easily be investigated. Work on these calculations is under way. There are 7 figures and 22 references, 12 of which are Soviet.

SUBMITTED: March 5, 1958

KRASIL'NIKOV, V.N., Cand Phys Math Sci -- (diss) "Non-stationary processes in fine linear vibrators." Len, 1959, 9 pp (Len Order of Lenin State Univ im A.A. Zhdanov) 150copies (KL, 28-59, 122)

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000826110(

S/046/60/006/02/09/019
B014/B014

AUTHOR: Krasil'nikov, V. N.
[redacted]

TITLE: The Effect of a Thin Elastic Layer on Sound Propagation in a Liquid Semispace

PERIODICAL: Akusticheskiy zhurnal, 1960, Vol. 6, No. 2, pp. 220-228

TEXT: The present paper deals with sound propagation in a homogeneous liquid semispace limited by a layer which is thin and elastic as compared to the wavelength. Proceeding from the wave equation (1) for the acoustical field the author develops equation (3) for the biharmonic oscillations of a homogeneous and isotropic elastic plate. Formula (4) is written down for the potential energy of a slightly inflected plate. A variation of this formula is used to calculate the disequilibration u and the boundary conditions. Equation (8) expresses the condition for the energy equilibrium in part S of the plate. The individual functions occurring under the sign of integration express the kinetic and potential energies as well as the power of external forces, and represent the two-dimensional vector of the energy current. Next, the author

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The Effect of a Thin Elastic Layer on Sound Propagation in a Liquid Semispace

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studies the incidence of a homogeneous plane wave on the plate under the angle θ. The set of equations (10) is given for the reflected field, and (11) describes the shift of the plate. Provided the sonic velocities in the liquid and in the plate are equal, the reflection- and excitation coefficients can be approached by (10a) and (11a). In the following the author studies a point source in the semispace which is bounded by a thin plate (Fig. 2). Formula (14) is obtained for the reflected wave. The expression occurring under the sign of integration, whose poles are significant (Fig. 3), is discussed, and the approximate expression (18) is obtained by integration of (14). The parameters R_1 and θ_0 denote the distance between the source and the point of reflection on the plate and/or the angle of incidence of the beam (Fig. 2). The approximate expression (19) is obtained for the bending waves. Next, the author studies the dispersion of the waves and the dependence of the wavelength of the bending waves upon the thickness of the plate. Further, the energy current in the plate is calculated, and formula (25) is obtained for the total energy current. Finally, formula (28) is written down for the group velocity of a point source of a pulse. L. M. Lyamshev and

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The Effect of a Thin Elastic Layer on Sound Propagation in a Liquid Semispace

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S. Ye. Lekhnitskiy are mentioned in the present paper. The author thanks V. S. Grigor'yev for his interest in the problems discussed here. There are 4 figures and 4 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: December 26, 1959

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KRASIL'NIKOV, V.N.

Effect of transmission lines on the ground field of radio waves. Radiotekhnika 15 no.7:3-9 Jl '60.

(MIRA 13:7)

(Radio waves)

BORISOV, V.V.; KRASIL'NIKOV, V.N.

Scattering of waves on random inhomogeneities of a medium with a variable refractive index. Probl.dif.i raspr. voln 2:102-110 '62. (MIRA 16:4)
(Scattering (Physics)) (Radio waves) (Refractive index)

KRASIL'NIKOV, V.N.

Unsteady radiation from thin linear vibrators. Probl.dif.i raspr. voln 2:111-131 '62. (MIRA 16:4)
(Vibrators) (Electromagnetic fields)

S/046/62/008/001/008/018
B125/B102

AUTHOR: Krasil'nikov, V. N.

TITLE: Refraction of bending waves

PERIODICAL: Akusticheskiy zhurnal, v. 8, no. 1, 1962, 79 - 84

TEXT: From the minimum condition for potential energy the equilibrium for static bending of a plate has been found. The plate was assumed to be infinitely expanded and inhomogeneous with a varying thickness h(x,y), variable Young's modulus E(x,y) but with a nearly constant Poisson ratio σ. The calculations were made according to a scheme of L. D. Landau and Ye. M. Lifshits (Mekhanika sploshnykh sred. (Mechanics of continuous media) M., GITTL, 1954). The nearly flat profile of the plate is assumed to be symmetrical with respect to the central plane Z = 0. From the elastic energy dV per volume element dw of the plate bent statically by an external and normal force P(x,y) (u(x,y) - static bending, u - vertical shift of a point in the central plane from its equilibrium position) the expression

$$V = {}^1/_2 \iint\limits_{-\infty}^{\infty} D(x,y)\left\{(\nabla^2 u)^2 + 2(1-\sigma)\left[\left(\frac{\partial^2 u}{\partial x\,\partial y}\right)^2 - \frac{\partial^2 u}{\partial x^2}\frac{\partial^2 u}{\partial y^2}\right]\right\}dx\,dy \quad (1a)$$

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Refraction of bending waves

is obtained for the total potential energy by integration. The rigidity is given by $D(x,y) = E(x,y)h^3(x,y)/12(1 - \sigma^2)$ (2) and Eq.

$$(1-\sigma)\left\{2\frac{\partial^2 D}{\partial x\,\partial y}\frac{\partial^2 u}{\partial x\,\partial y}-\frac{\partial^2 D}{\partial x^2}\frac{\partial^2 u}{\partial y^2}-\frac{\partial^2 D}{\partial y^2}\frac{\partial^2 u}{\partial x^2}\right\}+\nabla^2(D\nabla^2 u)=P(x,y). \quad (3)$$

represents the final equation for the static bending of an inhomogeneous plate. In the general case the system consisting of $\nabla^2\varphi = 0$ (4), of the kinematic contact condition at the boundary of the liquid half-space and the elastic plate $\partial u/\partial t = \partial\varphi/\partial z\big|_{z=0}$ (5) and of the equation of motion of a weightless thin plate cannot be solved. For slightly inhomogeneous plates (D is only a function of the distance) the method of geometrical optics is applicable and the solution obtained

$$u=\frac{k_0}{i\omega}\Phi(x,y)e^{ik_0\Psi(x,y)},$$

$$\varphi=F(x,y,z)e^{ik_0\Psi_1(x,y)-k_0f(z)}, \quad (9)$$

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Refraction of bending waves

is similar to a plane bending wave - the simplest solution of this problem. For the functions Φ, F, ψ, ψ_1 and f, standard conditions used in geometrical optics are valid. The equations of the bending wave obtained by substituting (9) into (4), (5), (6) read in the approximation of geometrical optics as follows $(\nabla\psi_1)^2 = (\partial f/\partial z)^2$ (10) $\nabla^2 F = 0$; $\psi(x,y) = \psi_1(x,y)$, $\Phi(x,y) = F(x,y,0)(\partial f/\partial z)_{z=0}$ (interrelation of phases and amplitudes of the wave in the liquid and plate); $D\Phi k_0^4(\nabla\psi)^4 = \varrho\omega^2 F$, $2(\nabla\Phi\nabla\psi) + 2\Phi\nabla^2\psi + (\Phi/D)(\nabla D\nabla\psi) = 0$ (15). The equation for the phase function $|\nabla\psi|^{10} = n^{10}(x,y)$ is identical to the ordinary eiconal equation $(\nabla\psi)^2 = n(x,y)$ for ordinary bending waves. From this lines of equal phase and also the beam can be found. Eq. (15) can be transformed to $(\nabla\Phi\cdot\nabla\psi) = \Phi\nabla^2\psi$. The amplitude along a differentially small sheet will change as $\Phi(M_2) = \Phi(M_1)\sqrt{dl_1/dl_2}\,(n_2/n_1)$. The present method is not suited to describe fields near their sources. The beams are parabolic (Fig. 3) for an index of refraction of $n(y) = \sqrt{1 + \beta y}$ where $\beta \ll k_0$ and
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Refraction of bending waves

$\beta > 0$. The beams are refracted toward positive y and in the half space $y < 0$ a shadow zone is formed. Beams reflected in the lower half space will form the caustic plane $\varrho = 2/(1 - \sin\varphi)$. There are 3 figures and 5 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: March 28, 1960

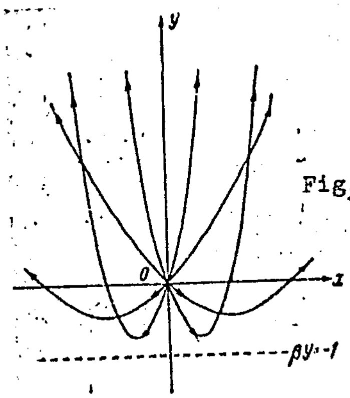

Fig. 3

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KRASIL'NIKOV, V.N.

Generation of flexural gravitational waves. Akust.zhur. 8 no.1:133-136 '62. (MIRA 15:4)

1. Leningradskiy gosudarstvennyy universitet.
(Gravitation) (Sound waves)

S/046/62/008/002/004/016
B104/B138

AUTHOR: Krasil'nikov, V. N.

TITLE: Scattering of bending waves by inhomogeneities of an elastic plate

PERIODICAL: Akusticheskiy zhurnal, v. 8, no. 2, 1962, 183 - 188

TEXT: The article deals with the scattering of elastic waves by random fluctuations in the rigidity of a thin elastic plate lying on a semi-space filled with an imcompressible fluid. The rigidity D of the plate is described by $D(x,y) = D_0 + \Delta D(x,y)$. The scattering field is computed by means of perturbation theory using the relative inhomogeneity factor $\mu(x,y) = \Delta D(x,y)/D_0$. By the method of L. A. Chernov (Rasprostraneniye voln v srede so sluchaynymi neodnorodnostyami - Propagation of waves in a medium with random inhomogeneities - M., Izd-vo AN SSSR, 1958) the system of equations

$$\nabla^2\varphi_1 = 0,$$

$$-i\omega u_1 = \frac{\partial\varphi_1}{\partial z}\Big|_{z=0},$$

$$D_0\nabla^4 u_1 = F(\mu, u_0) - i\omega\rho\varphi_1|_{z=0},$$

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